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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,752	12/10/2003	Hideki Nakata	8861-480US (P32440-01)	1986
570	7590	01/27/2005	EXAMINER	
AKIN GUMP STRAUSS HAUER & FELD L.L.P. ONE COMMERCE SQUARE 2005 MARKET STREET, SUITE 2200 PHILADELPHIA, PA 19103-7013			RO, BENTSU	
			ART UNIT	PAPER NUMBER
			2837	

DATE MAILED: 01/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/734,752	NAKATA ET AL.	
	Examiner	Art Unit	
	Bentsu Ro	2837	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-7 and 11-26 is/are rejected.
- 7) ☒ Claim(s) 3 and 8-10 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
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| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/10/03</u> . | 6) <input type="checkbox"/> Other: ____ |

FIRST OFFICE ACTION

1. Drawing correction is required as follows:
 - In Figs. 33 and 34, label these figures as "prior art".
2. Claim 4 correction is required as follows:
 - Claim 4, line 3, the recitation "said voltage command value" lacks antecedent basis.
3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 4, 5 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Marcinkiewicz et al US Patent No. 5,457,375. (For simplification, this reference is referred by the examiner as "Marc" reference.)

The following table shows the claimed elements and the corresponding Marc reference teaching.

The claims:	Marc reference teaches:
1. A motor control apparatus comprising: an inverter circuit which receives a fluctuating voltage,	Fig. 1 shows a sensorless controller for a brushless PM motor; Fig. 1 shows an inverter I; the +Bus and -Bus is a fluctuating voltage because there is no filter capacitor after the AC/DC converter; also see column 1, lines 48-50; column 4,

<p>converts said voltage into a desired voltage and outputs said desired voltage to a brushless motor, and</p> <p>a control section which receives the input voltage to said inverter circuit,</p> <p>a motor current flowing to said brushless motor</p> <p>and a motor current command value indicating the value of a current required to flow to said inverter circuit, for controlling said inverter circuit</p> <p>by maintaining the phase of the voltage applied to said brushless motor when the value of the input voltage to said inverter circuit is smaller than the value of the voltage required to be applied to said brushless motor.</p>	<p>lines 14-15; and the current waveforms in Figs. 9, 16A-C;</p> <p>the inverter I converts the fluctuating bus voltage +Bus/-Bus into a desired voltage and applies the desired voltage to the motor M as shown in Fig. 1;</p> <p>Fig. 1 shows a sensorless controller 10, which is a control section; the controller receives +Bus voltage which is the input voltage to the inverter circuit I;</p> <p>Fig. 1 shows a current shunt H, which current shunt H is a current sensor for sensing the motor current;</p> <p>Fig. 1 shows a command for inputting a command value to a mode controller 22; Fig. 3 shows the structure of the mode controller 22; the mode controller 22 includes a low pass filter 26, a switching module 28; the switching module 28 has four positions; the second position receives a torque command; it is noted that the torque command is a current command because current produces torque; further, Fig. 3 shows a summing circuit 32b for summing the bus current I-BUS with the torque command, thus, the torque command must be a current value; the outputs of the mode controller 22 are connected to a commutation controller 24 for controlling the inverter circuit I;</p> <p>Marc teaches a phase control by maintaining the phase synchronization between the motor phase (the supplying current phase) and the motor rotor, see the words "in phase" in column 1, lines 24-33; it is noted that, at least when the time</p>
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	instant at which the current ripple is at a minimum point, the value of the input voltage to said inverter circuit would be smaller than the value of the voltage required to be applied to said brushless motor.
2. A motor control apparatus in accordance with claim 1, wherein said control section estimates the rotation phase of the brushless motor on the basis of the current of said brushless motor.	Marc teaches the use of current ripple to control the motor commutation, see abstract line 2 and Figs. 16A-C.
4. A motor control apparatus in accordance with claim 1, wherein said control section calculates said voltage command value by using a calculation equation having a noninteracting term.	the phrase "said voltage command value" is undefined, therefore, the claimed subject matter becomes unclear; however, Marc reference Fig. 4 includes a constant term K_P that is a noninteracting term.
5. A motor control apparatus in accordance with claim 1, wherein said control section detects the voltage of said inverter circuit, estimates a voltage to be applied to said inverter circuit at the next control cycle and controls said inverter circuit.	Fig. 1 shows a VBUS that is a voltage of the inverter; Fig. 3 shows a V_{OUT} (at the lower-right corner) which is a voltage to be applied to the inverter at the next cycle; Marc reference teaches "algorithm" control, therefore, each output should be applied to the controller in the next cycle, see the "algorithm" in column 5, lines 7-10 for example.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6, 7, 11-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marc reference.

Regarding claim 6 and 7, the limitation "small capacitance" and "small inductance" are considered unpatentable because of the following reasons:

- The word "small" is a relative and qualitative term. How small is small is unclear.
- There is no functionality of the capacitance and the inductance. Without the operational functionality, one can always add a certain item to the Marc's circuit to make the circuit different from Marc's circuit. For example, one can add a fuse, a light, a control knob, a relay, etc to Marc's circuit to make the circuit different from the Marc's circuit.
- A capacitance and an inductance on the dc side is prior art. Most dc circuits have either the capacitance or inductance or both.
- The bus wires have certain small parasitic inductance and parasitic capacitance. Thus, claims may read onto these parasitic inductance and parasitic capacitance.

Regarding claims 11-13, the inherent parasitic small inductance and small capacitance of the bus wires read onto the limitation of these claims.

Regarding claims 14-26, Marc reference does not teach the various different appliances or equipments, such as a compressor, a washing machine, etc. However, these appliances or equipments require a motor, which is a well-known art. In view of Marc teaching, it would have been obvious to a skilled person in the art to use Marc's motor to run these appliances or equipments.

Art Unit: 2837

Then why??

Marc's brushless motor and its controller are simple, less bulky and easy to make because there is no bulky items such as a filtering capacitor and an inductor, and no Hall sensor which is hard to install.

Because Marc's controller has at least the above-mentioned advantages, it would have been obvious to a skilled person in the art to use Marc's controller in the above-mentioned appliances or equipments.

7. Claims 3 and 8-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication should be directed to Bentsu Ro at telephone number (571) 272-2072.

1/25/2005


Bentsu Ro
Senior Examiner
Art Unit 2837